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ABSTRACT

Designed to explore new reading readiness predictors that are not found extensively in the more commonly used commercial group tests and to develop new indices to measure the level of reading readiness of beginning first graders, a study was undertaken involving 115 children. The factor of sex in reading readiness was also investigated. An experimental test composed of subtests in predicting outcomes, basic language concepts, spatial relations concepts, and auditory reception was administered to the subjects at the beginning of the 1975-76 school year. The Canadian Readiness Tests (CRT) were also administered at that time. In February, the Bond-Balow-Hoyt (BBH) reading development tests were given. Results show that the learning rate subtest of the CRT and the spatial relations concepts subtest on the experimental test were significant predictors of reading achievement on all subtests of the BBH. No significant differences were found in reading readiness between boys and girls on the experimental test. However, on the CRT there were significant differences between the sexes on the word matching and semantics subtests. The reading achievement tests showed no significant differences. (FL)

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AN INVESTIGATION OF READING READINESS TESTS, AND OF SELECTED AUDITORY PERCEPTION, VISUAL PERCEPTION, AND LANGUAGE SKILLS INVOLVED IN READING READINESS

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ABSTRACT

The investigators developed indices to measure some aspects of visual and auditory perception, and basic language concepts at the reading readiness level in order that some new knowledge might be added to help construct tests which are more accurate predictors of reading achievement in the first grade. The Experimental Reading Readiness Test and the Canadian Readiness Test by Evanechko, Ollila, Downing and Braun, were administered in September, 1975 to 115 first grade children in the Sooke District located on the lower Vancouver Island in British Columbia. The Bond-Balow-Hoyt: The New Developmental Reading Tests were administered in February, 1976. Analysis was by multiple linear regression to determine which subtests were the best predictors of reading achievement. Results show that the Learning Rate subtest on the Canadian Readiness

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Test and Spatial Relations Concepts on the Experimental Reading Readiness Test were highly significant predictors of reading achievement on all three subtests of the Bond-Balow-Hoyt.

The factor of sex in reading readiness was also investigated. The Experimental Reading Readiness Test indicated no significant difference between boys and girls in reading readiness. On the Canadian Readiness Test, however, the girls were superior on two subtests, Word Matching and Semantics. In reading achievement on the Bond-Balow-Hoyt: The New Developmental Reading Tests, there were no significant differences between boys and girls by February when the reading achievement tests were administered.

INTRODUCTION

Authorities in reading do not agree as to which factors constitute reading readiness. The components that influence reading are often so involved and interwoven that it is very difficult to determine which single factor or group of factors are the most significant to reading readiness. Durkin (1970) concluded that the variety of abilities in both kind and amount, which add up to readiness, suggest that a more accurate descriptive term would be 'readinesses'.

Barrett (1965), Spache (1965), and Weintraub (1967)

concluded that test instruments must be found that are better predictors of reading achievement than those now in existence.

Evanechko, Ollila, Downing, and Braun (1973) stated that few studies have been concerned with identifying the nature of reading readiness or selecting the optimum combination of tests to predict reading success. Considerable re-examination of readiness measures need to be made in order to find the best predictors of reading achievement.

THE PURPOSE OF THE STUDY

This study was designed to explore new reading readiness predictors that are not found extensively in the more commonly used commercial group tests, and to develop new indices to measure the level of reading readiness of beginning first graders. It was not the author's purpose to duplicate the reading readiness subtests that are already found to be good predictors of reading achievement. One area of auditory perception, visual perception, and language were considered. The specific aims were as follows:

1. To identify and develop indices in the following:
    a) Predicting Outcomes
    b) Basic Language Concepts
    c) Spatial Relations Concepts

d) Auditory Reception

2. To determine which are the best reading readiness predictors of reading achievement.
3. To determine if there are significant differences between boys and girls in reading readiness and reading achievement scores on the tests used in this study.

THE SAMPLE

Subjects used in this study were one hundred and fifteen children from seven first grade classrooms randomly selected from schools located in the Sooke School District on the lower Vancouver Island in British Columbia. Sixty-two boys and fifty-three girls from rural and urban areas were involved in the investigation.

CONTENTS OF THE EXPERIMENTAL READING READINESS TEST

The four subtests developed are listed below:

1. Basic Language Concepts: Thirty items were designed to test the child's basic language concepts that he/she had acquired through experience.
2. Predicting Outcomes: Thirty items were designed to test the child's auditory comprehension and his/her ability to predict what will happen next when the context is given orally by the examiner.
3. Spatial Relations Concepts: Thirty items were designed to test the child's concepts of space and his/her

experiences and understanding of spatial relationship terms, such as, over, under, beside.

4. Auditory Reception: Thirty items were designed to measure the child's ability to derive meanings from verbally presented materials.

ADMINISTRATION OF THE TESTS

The author's Experimental Reading Readiness Tests (ERR) were administered by the classroom teachers during the second and third weeks of September, 1975. No more than two subtests were administered in one sitting. The Canadian Readiness Tests (CRT), by Evanechko, Ollila, Downing and Braun (1970), were also administered during the same two weeks. During the last two weeks of February, the Bond-Balow-Hoyt: The New Developmental Reading Tests (BBH) were administered. All tests were scored by the classroom teachers and then rechecked by the investigator.

ANALYSIS OF THE RESULTS

The analysis of data, means and standard deviations were computed for the Experimental Reading Readiness Tests (X1 to X4) to give a general picture of test performance. The means ranged from 25.26 out of 29 items on the Basic Language Concepts subtest to a low of 22.5 out of 30 items on the Auditory Reception subtest. Results showed that on the average, the children scored high on the investigator's readiness test. (See Table 1).

SEX DIFFERENCES IN READING READINESS AND READING ACHIEVEMENT

The Analysis of Variance was used to answer the question of whether or not there were any significant differences between reading readiness scores on the ERR and CRT between boys and girls and reading achievement scores on the BBH and sex. The Newman-Kuel's test was applied to the hypotheses that showed significant differences between boys' and girls' scores. No significant differences were found in reading readiness scores on the ERR between sexes. On two subtests of the CRT, Word Matching and Semantics, there were significant differences in reading readiness between boys and girls. When the BBH was administered in February no significant differences in reading achievement were found between sexes (see Table 2).

RELIABILITY OF INDEPENDENT VARIABLES ON THE ERR

The Kuder-Richardson reliability coefficient, which determines the internal consistency of the test, was computed for each of the four subtests on the ERR. The results of the reliability analysis revealed that two of the subtests, Auditory Reception and Spatial Relations Concepts showed a sufficiently high reliability of over .70 (Bruner and Kintz, 1968) (See Table 3).

The KR-20 reliability coefficient of .88 for the total ERR test shows a high reliability when the Experimental

battery is used as a whole.

THE CORRELATION ANALYSIS

The Pearson Product-Moment Correlation Analysis was used to determine the extent of the relationships among reading readiness and reading achievement measures, the significance of the relationships between the subtests on the ERR, CRT, and the BBH. (See Table 4). (A two tailed test was used to find the p significance.) All the correlations proved to be significant, however, they varied as to the degree of correlation. The BBH showed very high correlations between subtests ($r = .80$ to $r = .85$), suggesting that the three subtests were to a large degree measuring the same facet of reading achievement.

The ERR subtests showed the lowest degree of interrelatedness with coefficients ranging from $r = .34$ to $r = .47$. The commonality between the four subtests as a group is low enough to assume that each subtest is to a large degree measuring a different facet of reading readiness.

MULTIPLE REGRESSION ANALYSIS TO DETERMINE THE BEST PREDICTORS

Several multiple linear regression models were tested to determine which readiness measures were the best predictors of reading achievement. The stepwise regression analysis was employed and the predictor variables entered the regression equation in the order of their greatest

contribution to the increase in R^2. Tested for significance was each entering variable. Results showed that the Learning Rate subtest on the CRT was the best predictor of reading achievement on all three subtests of the BBH, significant with a probability level of $p < .000$ on all three subtests. The Spatial Relations Concepts subtests on the investigator's ERR was also a significant predictor of reading achievement at the $p < .01$ to $p < .001$ level of significance on all three reading subtests (See Tables 5 through 10). The Basic Language Concepts subtest on the investigator's ERR proved to be a significant predictor of reading achievement on the BBH subtest Comprehending Significant Instructions, at the $p < .025$ level of significance (see Table 7).

DISCUSSION

The subtest Spatial Relations Concepts proved to be the best predictor of reading achievement on the investigator's Experimental Reading Readiness Test. Basic Language Concepts was a significant predictor on the one subtest of the BBH - Comprehending Specific Instructions.

On the Canadian Readiness Test, Learning Rate proved to be the best predictor of reading achievement on all three subtests of the BBH. These results are markedly different from those found by Evanechko et al. In their study, they found Letter Recognition to be the best predictor of reading achievement on the BBH, whereas, in

this study, Learning Rate proved to be the best predictor. Letter Recognition placed fourth and fifth place as the best predictor on the three subtests of the BBH in this study. The reasons for the differences in the results could be as follows: 1) Evanechko et al. used a smaller sample of 97 as compared to 115; 2) because of the rapid increase in population as the Sooke District becomes more urbanized each year the characteristics of the sample may have changed somewhat; 3) the investigators of the previous study administered the reading achievement test (BBH) in May, whereas, in this study, it was administered in February; 4) different reading programs may have been used.

No significant differences were found in reading readiness between boys and girls on the investigator's Experimental battery. On the CRT, however, there were significant differences between the sexes on two of the subtests: 1) Word-matching and 2) Semantics. In reading achievement there were no significant differences found between boys and girls on the three subtests of the BBH.

The investigator's Experimental battery showed a very high coefficient of reliability as a total test, indicating that it could be used in testing for reading readiness. Auditory Reception and Spatial Relations Concepts had a high reliability coefficient as individual subtests of the ERR.

IMPLICATIONS

From the findings of this study, Spatial Relations Concepts and Learning Rate appear to be important contributors to reading readiness. Further research is needed to improve reading readiness tests in order that they be better predictors of reading achievement. Reading readiness predictors should not be discarded until they have been tested with different populations and also under different classroom instruction.

Girls did not prove to be superior to boys in reading achievement, as has been found in other studies. This may not, however, have remained true if the reading achievement tests had been administered in June instead of February. Further investigation into reading readiness and achievement between boys and girls is needed. Instructional needs for boys should also be investigated.

REFERENCES

Barrett, T. C. The relationship between measures of prereading visual discrimination and first-grade reading achievement: A review of the literature. Reading Research Quarterly, 1965, 1, 51-76.

Bond, G., Balow, C. & Hoyt, C. Bond-Balow-Hoyt: The New Developmental Reading Tests. Chicago, Lyons & Carnahan, Inc., 1965.

Brunig, J. L. & Kintz, B. L. Computational handbook of statistics. Glenville, Illinois: Scott, Foresman, 1968.

Durkin, D. Reading readiness. The Reading Teacher, 1970, 23, 529-534; 564.

Evanechko, P., Ollila, L., Downing, J. & Braun, C. Canadian Readiness Test. Unpublished, University of Victoria, 1970.

Evanechko, P., Ollila, L., Downing, J. & Braun, C. An investigation of the reading readiness domain. Research in the Teaching of English, 1973, 7, 61-78.

Spache, G. D. Estimating language potential of children: Reading and the related arts. Twenty-first Reading Conference and Course on Reading, 1965, 95-101.

Weintraub, S. Readiness measures for predicting reading achievement. The Reading Teacher, 1967, 20, 551-558.

TABLE 1

MEANS, VARIANCES AND STANDARD DEVIATIONS FOR THE EXPERIMENTAL READING READINESS TEST, CANADIAN READINESS TEST AND THE BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Step No.	Variable	Mean	Variance	Standard Deviation
Experimental Reading Readiness Test:				
X1	Basic Language Concepts	25.26	5.84	2.42
X2	Predicting Outcomes	22.49	12.55	3.54
X3	Spatial Relations	23.18	12.51	3.54
X4	Auditory Reception	22.35	21.55	4.64
Canadian Readiness Test:				
Y1	Technical Language of Literacy	13.18	13.68	3.70
Y2	Letter Recognition	18.03	15.90	3.99
Y3	Word Matching	16.10	18.56	4.31
Y4	Beginning Sounds	16.33	11.09	3.33
Y5	Semantics	29.00	52.33	7.23
Y6	Learning Rate	16.81	20.62	4.54
Bond-Balow-Hoyt: The New Developmental Reading Tests:				
Z1	Word Recognition	19.97	59.17	8.31
Z2	Comprehending Significant Ideas	16.39	111.21	10.55
Z3	Comprehending Specific Instructions	13.29	37.57	6.13

TABLE 2

MEANS, STANDARD DEVIATIONS AND P SIGNIFICANCE ON THE EXPERIMENTAL READING READINESS, CANADIAN READINESS AND THE BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS OF BOYS AND GIRLS IN FIRST GRADE

Variable	Mean Boys N = 62	Mean Girls N = 53	SD Boys	SD Girls	F	Mean p Sig.
Experimental Reading Readiness Test						
1. Basic Language Concepts	24.98	25.58	2.44	2.40	1.76	0.187
2. Predicting Outcomes	22.68	22.26	3.66	3.46	0.38	0.537
3. Spatial Relations	22.98	23.42	3.53	3.60	0.42	0.519
4. Auditory Reception	22.45	22.23	5.18	4.02	0.07	0.798
Canadian Readiness:						
5. Technical Language of Literacy	13.21	13.15	3.37	4.12	0.01	0.933
6. Letter Recognition	17.87	18.21	3.95	4.10	0.20	0.655
7. Word Matching	15.26	17.09	4.63	3.75	5.34	0.022*
8. Beginning Sounds	16.50	16.13	3.34	3.37	0.34	0.559
9. Semantics	27.76	30.45	7.50	6.77	4.03	0.047*
10. Learning Rate	16.65	17.00	4.59	4.56	0.17	0.679
Bond-Balow-Hoyt:						
11. Word Recognition	19.85	20.11	8.45	8.32	0.03	0.870
12. Comprehending Significant Ideas	15.53	17.40	10.84	10.30	0.88	0.349
13. Comprehending Specific Instructions	12.52	14.17	6.10	6.16	2.08	0.152

*$p \geq .05$

TABLE 3

MEANS, STANDARD DEVIATIONS, RANGES, AND THE KUDER-RICHARDSON RELIABILITY COEFFICIENT FOR THE TOTAL SAMPLE ON THE EXPERIMENTAL READING READINESS SUBTESTS

Variable	Mean	SD	Range	KR-20
X1 Basic Language Concepts	24.69	2.51	17-29	0.505
X2 Predicting Outcomes	21.78	3.94	7-29	0.679
X3 Spatial Relations	23.03	3.58	13.29	0.706
X4 Auditory Reception	22.16	5.10	0.30	0.814
Total Test	91.65	11.40	50-112	0.876

N = 115

TABLE 4

INTERCORRELATIONS BETWEEN SUBTESTS ON EXPERIMENTAL READING READINESS, CANADIAN READINESS AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Variable	1	2	3	4	5	6	7
1.	1.000						
2.	0.372***	1.000					
3.	0.415***	0.466***	1.000				
4.	0.338***	0.349***	0.436***	1.000			
5.	0.281**	0.475***	0.358***	0.185*	1.000		
6.	0.331***	0.307***	0.341***	0.245**	0.536***	1.000	
7.	0.331***	0.432***	0.365***	0.259**	0.372***	0.453***	1.000
8.	0.432***	0.418***	0.439***	0.362***	0.507***	0.621***	0.402***
9.	0.449***	0.397***	0.398***	0.237*	0.415***	0.342***	0.407***
10.	0.357***	0.363***	0.362***	0.233*	0.462***	0.663***	0.590***
11.	0.322***	0.338***	0.427***	0.264**	0.285**	0.405***	0.384***
12.	0.294***	0.220*	0.365***	0.240**	0.229**	0.316***	0.391***
13.	0.348***	0.285**	0.426***	0.289**	0.262**	0.389***	0.434***

Readiness and Reading Tests *p ≥ .05 **p ≥ .01 ***p ≥ .001

Readiness: Numbers 1 to 10; Reading: Numbers 11 to 13.

1. Basic Language Concepts
2. Predicting Outcomes
3. Spatial Relations Concepts
4. Auditory Reception
5. Technical Language of Literacy
6. Letter Recognition
7. Word Matching
8. Beginning Sounds

TABLE 4

INTERCORRELATIONS BETWEEN SUBTESTS ON EXPERIMENTAL READING READINESS, CANADIAN READINESS AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Variable	8	9	10	11	12	13
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.	1.000					
9.	0.330***	1.000				
10.	0.660***	0.310***	1.000			
11.	0.454***	0.248**	0.574***	1.000		
12.	0.358***	0.241**	0.465***	0.799***	1.000	
13.	0.444***	0.303***	0.546***	0.834***	0.850***	1.000

Readiness and Reading Tests *p ≥ .05 **p ≥ .01 ***p ≥ .001

Readiness: Numbers 1 to 10; Reading: Numbers 11 to 13.

9. Semantics
10. Learning Rate
11. Word Recognition
12. Comprehending Sigificant Ideas
13. Comprehending Specific Instruction

TABLE 5

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #1				
Step No.	Variable	Word Recognition % of Variance R^2	Probability Level	Standard Error
1.	Spatial Relations	18.56	0.000*	7.572
2.	Basic Language Concepts	21.10	0.060	7.486
3.	Predicting Outcomes	22.64	0.140	7.446
4.	Auditory Reception	22.79	0.651	7.472

N = 115

TABLE 6

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #2				
Step No.	Variable	Comprehending Significant Ideas % of Variance R^2	Probability Level	Standard Error
1.	Spatial Relations	13.58	0.000*	9.890
2.	Basic Language Concepts	16.02	0.074	0.793
3.	Auditory Reception	16.38	0.490	9.816
4.	Predicting Outcomes	16.40	0.887	9.859

N = 115

TABLE 7

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #3				
Step No.	Variable	Comprehending Specific Instructions % of Variance R^2	Probability Level	Standard Error
1.	Spatial Relations	18.48	0.000*	5.583
2.	Basic Language Concepts	22.04	0.025*	5.484
3.	Auditory Reception	22.68	0.343	5.486
4.	Predicting Outcomes	22.88	0.591	5.504

N = 115

TABLE 8

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS, CANADIAN READINESS, AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #1				
Step No.	Variable	Word Recognition % of Variance R^2	Probability Level	Standard Error
1.	Learning Rate	33.56	0.000*	6.839
2.	Spatial Relations	39.12	0.002*	6.576
3.	Predicting Outcomes	39.37	0.494	6.591
4.	Technical Language of Literacy	39.67	0.463	6.605
5.	Basic Language Concepts	39.85	0.570	6.625
6.	Auditory Reception	39.93	0.707	6.652
7.	Beginning Sounds	39.98	0.759	6.680
8.	Semantics	40.01	0.829	6.710
9.	Word Matching	40.01	0.973	6.742
10.	Letter Recognition	40.01	0.993	6.774

N = 115

TABLE 9

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS, CANADIAN READINESS, AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #2				
Step No.	Variable	Comprehending Significant Ideas % of Variance R^2	Probability Level	Standard Error
1.	Learning Rate	21.99	0.000*	0.396
2.	Spatial Relations	26.48	0.010*	9.162
3.	Word Matching	27.55	0.204	9.137
4.	Basic Language Concepts	27.91	0.458	9.155
5.	Predicting Outcomes	28.36	0.412	9.169
6.	Auditory Reception	28.59	0.554	9.196
7.	Letter Recognition	28.74	0.634	9.229
8.	Technical Language of Literacy	28.77	0.844	9.270
9.	Beginning Sounds	28.78	0.868	9.314
10.	Semantics	28.79	0.904	9.358

N = 115

TABLE 10

MULTIPLE REGRESSION - EXPERIMENTAL READING READINESS, CANADIAN READINESS, AND BOND-BALOW-HOYT: THE NEW DEVELOPMENTAL READING TESTS

Subtest #3				
Step No.	Variable	Comprehending Specific Instructions % of Variance R^2	Probability Level	Standard Error
1.	Learning Rate	30.33	0.000*	5.162
2.	Spatial Relations	36.38	0.001*	4.954
3.	Word Matching	37.17	0.240	4.945
4.	Basic Language Concepts	37.80	0.295	4.943
5.	Technical Language of Literacy	38.21	0.398	4.949
6.	Auditory Reception	38.52	0.461	4.960
7.	Semantics	38.66	0.620	4.977
8.	Beginning Sounds	38.80	0.624	4.995
9.	Predicting Outcomes	38.91	0.668	5.014
10.	Letter Recognition	38.93	0.848	5.037

N = 115